Bob Swale
FAX 886-4071

125

In the Remedial Investigation Report for the ACS-NPL site, three types of habitats are described. Two wetland areas occur on the site, and are described in a wetland delineation done by the USFWS as having high natural resource value due to the diversity of habitat types. In the northwest corner of the site is a mature oak hardwood stand, and the inactive landfill and part of the off-site containment area provide some field (grassland) habitat.

The Remedial Investigation states that the ACS watershed is hydrologically isolated. Water sources are primarily from precipitation within the watershed, and most discharge is through evapotranspiration and infiltration. Prior to the early 1980's, surface water flowed through a drainage ditch and discharged to a wetland south of the active landfill area. The landfill has expanded, and this ditch is dewatered and no longer acts as a surface water runoff route. A ditch west of the off-site containment area is a surface water flow path which drains toward the landfill excavation. Groundwater discharges into the latter drainage ditch and into Wetland I.

Most of the surface drainages described are ephemeral ditches. Based on the density of cattails around it, a ditch through wetland I appears to contain water much of the year. Fish and Wildlife Service has reported fish are present in this ditch.

Permanent ponds on the site include a fire pond and process lagoon on the ACS property and a disposal cell at the landfill.

The ACS plant ponds do not provide aquatic habitat because of their industrial use. Water is continually being pumped from the disposal cell on the landfill in anticipation of future use.

The F&WS delineated and described two wetland areas in the Site watershed. The northern wetland, designated wetland I, is approximately 29 acres, while wetland II, located south of the Chesapeake and Ohio railroad tracks, is approximately 5 acres. The wetland communities are described in the RI report.

Mature oak forests are located on the western and northeastern corners and on the eastern side of the site. The perimeter of the woods includes species typical of disturbed areas, such as cottonwoods, aspens and sumacs. The inactive landfill and parts of the off-site containment area provide some field (grassland) habitat. The remaining terrestrial areas are developed or are devoid of vegetation.

Based on the types of habitat present on site, the following species were evaluated for potential risks: mink, herbivorous aquatic mammals (e.g. muskrat), diving ducks and a piscivorous bird (e.g. heron).

Contaminants of ecological concern are those detected in environmental media of the habitats on-site. These habitats, and environmental media which were sampled, include:

Wetland surface waters and sediments
Drainage ditch surface waters and sediments
Soils from the off-site containment area

Chemicals of concern for terrestrial habitats are considered to

be those chemicals found in shallow soils (≤ 4 feet depth). Chemicals found in deeper soils are generally not readily available to biological communities. However, migration of contamination to the groundwater has occurred on-site, and there is groundwater discharge into wetland I. Risk calculations will be done using concentrations found in shallow soils, and also assuming potential exposure to maximum concentrations found in deeper soils via groundwater discharge.

Contaminants of ecological concern are listed in Table 7-39 of the RI Baseline Risk Assessment. Background for organic contaminants and for metals in surface waters is considered to be zero. Background concentrations for metals in soils are included in Table 7-39.

Contaminants and concentrations used in this risk assessment are presented in Table 1 of this document. PCB values shown are for total Arochlors. Seven of the metals found in surface waters exceeded either acute or chronic U.S. EPA Ambient Water Quality Criteria (AWQC). The Remedial Investigation did not address metal levels as it stated that the highest metal concentrations found in sediments were for metals which are considered essential plant nutrients. However, nonessential trace metals can be toxic at much lower levels (Eisler 1985). Because of a lack of data, this risk assessment will be conservative. Maximum contaminant concentrations found on-site will be used as exposure levels, and 100% availability of contaminants will be assumed. One method used to determine availability of contaminants in sediments, the

Equilibrium Partitioning approach (U.S. EPA 1988), uses the amount of a substance bound by sediments (unavailable) and the concentration in the interstitial water (available). This ratio depends on grain size and total organic carbon (TOC) content, which were not measured for sediment samples from this site. Therefore, 100% availability will be used.

The contaminants used in this assessment were chosen for the following reasons:

They are compounds which bioaccumulate in the food chain--PCBs and cadmium (Eisler 1986, Hammons et al. 1978).

Data is available on which assumptions about contaminant exposure of an organism via uptake through food items can be based.

Literature values are available to determine concentrations above which exposure poses a risk to an organism.

MINK

The home range of a mink is approximately 20 acres (Linscombe et al. 1982), and the area of wetland I on the ACS site is 29 acres. Calculated doses are multiplied by an area use factor to weight the estimated dose by the proportion of time the animal is expected to use the contaminated resource relative to its home range. The assumption is made that habitat on the home range is homogeneous, and that the animal spends an equal amount of time in each portion of the range. Since wetland I is larger than the average home range for mink, the area use factor is 100%. Therefore, 100% of the diet will be consumed in the contaminated wetlands on the ACS site.

To determine risk due to ingestion of contaminated prey, a

contaminant concentration in the prey is needed. Mink feed on small mammals, crayfish, fish and amphibians. For PCBs, the bioaccumulation factor (BAF) for small mammals is 0.07 (Charters 1991), for crayfish is 5.1, for frogs is 0.22 (Charters 1991), and for freshwater fish (fathead minnows) is 225,500. Bioaccumulation data are from U.S. EPA AWQC documents for specific chemicals unless stated otherwise. The BAF for the terrestrial species above are conservative as they incorporate soil organic content, whereas for this site it is assumed TOC is zero and availability is 100%. Assuming each of the above species represents an equal portion of the mink's diet, the contaminant dose for PCBs is:

The sum of : Concentration of PCBs in soil/surface water(ppm) * BAF/BCF for the prey species * % of diet, which equals:

(500)(0.07)(.25)+(.00084)(5.1)(.25)+(500)(0.22)(.25)+(.00084)(225,000)(.25) = 83.5 ppm

For protection of mink, the maximum permissible tissue concentration of their diet is 0.64 mg/kg (Plantonow and Karstad 1973). Based on the calculated dose, this diet was considered a risk for mink.

For cadmium, the BAF for crayfish is 184, for frogs is 130, and for freshwater fish is 2213. The calculated dose is:

(.00072)(184)(.33)+(159)(130)(.33)+(.00072)(2213)(.33) = 6821.7 ppm

For mammals, the dietary level of cadmium below which chronic effects should not occur is 100 ppb (Eisler 1985). Exposure from this diet is considered a risk to mink.

MUSKRAT